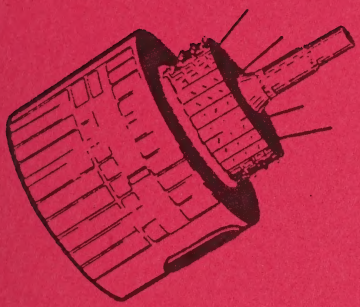
NEWSLETTER No. 9



REMOTE IMAGING GROUP

JUNE 1987

REMOTE IMAGING GROUP (R. I. G.)

NEWSLETTER No. 9 JUN 1987

Editor & Secretary — Phil Seaford G8XTW
14 Nevis Close, Leighton Buzzard, BEDS LU7 7XD
Tel: (0525) 384419 7.30 to 9.30 pm Please, General enquiries & PCB's

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Editorial and Secretaries page

We have had our agm at the Sandown Park rally but being arranged at the end of the event, was very poorly attended. The minutes are printed in this issue on page 6. Next year we hope to return to the midday slot in order to encourage a larger attendance but time wiil be tight.

News from Europe:
Patrick Hamptaux, the editor of Satellite News, the Belgian equivalent of Oscar news has been in touch. We will agree to exchange information from our respective newsletters (Only if I can improve my French!). Patrick says there is a lot of interest in weather satellites and now satellite tv. So maybe there will be some input for our proposed Sat. tv column.

We have also received news of a Dutch special interest group called 'WERKGROEP KUNSTMANEN', J H Scherhorn is the secretary and we will also be setting up a newsletter exchange arrangement. We have already received a bunch of newsletters which are being translated.

Valerie Newall, from Weatherwatch UK has been in touch with our chairman to remind us that they are the official point of contact for information on NOAA satellites and NOAA literature. Valerie says that many members of her mailing list are also RIG members. The best way seems to be to get on to the Weatherwatch mailing list in order to benefit from their services. Their address is NRSC Weatherwatch, Satellite Ground Station, RAE Lasham, Lasham airfield, Alton, HANTS. GU34 5SH. In the next issue I hope to be able to print a list of their services on offer.

Yet another new product has been added to our list of goodies: A simple mount for the RIG 1 metre dish to allow it to be fixed to a vertical pole. Given that it comprises of several lumps of folded metal this product will only be available at rallies or Leighton Buzzard. See back page for price details.

Forthcoming rallies include the the AMSAT-UK Colloquium (for the Sunday only) in July and of course the local favourite, Woburn in the first week of August.

We have had news from the NOAA bulletin board via David Bailey in the Isle of Wight that the scheduled launch date for NOAA-H (NOAA-11 if it makes orbit) is 29 October 1987.

Finally a continuing request for more copy for the newsletter. The continued success of the newsletter and indeed the group rests with contributions from the members.

Keep in touch, Phil

CHAIRMANS REPORT.

After all the hustle and bustle of the last few weeks, the AGM and then the BATC rally, its nice to settle down to do some work on my own equipment, but more of that later.
During the last 12 months we have co-opted Dick Boardman and Dermot Dobson onto our Committee, which was all officially confirmed at the AGM. Stan Ames was also elected to be a Committee member. The last Newsletter was printed by a new printer who is local to myself and all the address labels were stuck on by your Chairmans very own hand! So that's why you didn't get your copy! Of course I read all the labels and the wide variety of establishments amazed me. Doctors of this, that and the other, heads and senior lecturers, 6th form colleges, polytechnics, universities and colleges of higher education, various departments - physics, computer science, electronic engineering, geography and cybernetics , Royal Academy Science Centre, University College, School of Engineering Technology. Now the ones you would expect, Earth Satellite Research Unit, Information Technology, Remote Sensing Units, Ecological Monitoring Program, Meteorological Services Unit, Satellite Group, Space Technology, U.M.I.S.T., and even a lighthouse. This is far from a complete list but gives you an idea of the variety of membership we have gathered during the first two years. The countries are also very varied and omitting the locals, 3 in Norway, 4 in Sweden, 3 in Finland, Switzerland, Spain , 4 in Italy, Yugoslavia, Cyprus, 4 in Malta. Going further afield now, and Eastwards for a change, Tunisia, 2 in Zimbabwe, Oman, Pakistan, 6 in Australia, 4 in New Zealand, Vanatu S W Pacific, 8 in the USA and 6 in the West Indies. I think you will agree that that is quite a wide selection and something of which we can be proud.

The posting for the last Newsletter was 939, but, as there was a slight mix up on the renewal form, we circulated all members of '86 plus the new ones of 1987. Newsletter No. 9 will only go to fully paid-up members of '87, which I believe is 800+ already. This all adds up to your Chairman having to be very careful in what he says. In any event No. 8 Chairmans report had just one word missing and it left the sentence somewhat at a loss. Page 4, Para 2, Line 3 should have read "while I was lying in bed...."
I do sometimes hesitate whether to include similar comments, but anyone who knows me would find it unnatural for me to omit them. I shall just have to be more careful! Also on the political scene is another controversial subject, that of black boxes versus DIY equipment; always a difficult path to tread. In the early days there just wasn't any ready-built equipment and if you wanted something there was only one way - DIY. Nowadays there is a wide variety of ready-made equipment from which to chose if you have the money.

Being true experimenters, in every sense of the word, the ready-made stuff doesn't always meet your own requirements, and then all the modifications are brought out, perhaps just as tips, but nevertheless they are always welcomed by the editor as you just don't know who else also has that problem and the editor can quickly pass them on for everyone to share.

Back now to the work (if you can call it that) that yours truly has been doing. I've done more work with the Yagi; this time with more up to date information - the correct figures, well better ones, at least it works a lot better this time. The boom is .125" brass brazing rod and the elements are approx. 26 swg silver plated copper wire, obviously expensive stuff. Mk 1 had 14 elements and straight into the Microwave Modules down-convertor
gave quite a good signal. Remember the original one only gave me approx. 3db signal/noise, this increased to something like 7-8db. I tried a Gasfet preamp and the signals were received for a few minutes only, with quite good results, but as ever, while trying some modifications circuit-wise, when volts were re-applied nothing happened. A very expensive test as the Gasfet had cost me £25
and now only amplified noise, or was it only a noise generator? I had changed the input capacitor and the gate was only grounded by a 27k resistor. As you probably know, Gasfets only require 4/5 volts to break down and I must have exceeded this. As I was unable to get hold of a replacement for sometime I proceeded by adding another 11 elements to the Yagi which increased the signal/noise even further to approx. 9db, but the far end of the boom had a very pronounced "brewers droop" and was very difficult to aim. I had also noticed a loss of signal when the Yagi was inside the house looking through the double-glazed window, opening which, without moving the Yagi, increased the measured signal by 0.8db, and at these signal levels you just cannot afford even that small amount of loss. The Mk 2 version is up to 25 elements but supported by a very dry garden cane - the wife hasn't missed it yet.

At the Sandown convention one of the first things I did was to visit the RSGB Microwave stand and purchased an MGF 1402. I am told the exotic varieties have good noise figures at 1700 MHZ but the cheaper ones can often beat them at the lower frequencies. It didn't take long to try it but this time I had a choke directly to ground on the gate circuit and the input capacitor was removed because the Yagi is short-circuit to ground, DC-wise.
I can assure you I was very careful when inserting the device, I think a sudden door banging or something splashing to earth would have definitely given me a laundry problem!

Well it works; the signal to noise is now very much improved and gives quite good images and the signal to noise (estimated) must be approaching 20db with 2-4% noise. The only thing left now is to encapsulate the aerial so the elements don't get bent so frequently, but I cannot do that until I'm absolutely satisfied with it. One other point to note is that the bias on the Gasfet must be set to the correct figure as the noise figure varies so much with even a small deviation in drain current.

I was ultra-cautious and only set 5ma which even then was better than a NE64535 amplifier, but by increasing ma by ma the noise figure was gradually reduced until at 18ma I achieved the lowest figure.
A further increase to 20ma incresed the noise by 200/300% so be careful.

Now to the other subject of my endeavours these past few weeks -the K460 Fax recorder. I won't go into all the lurid details but the Helix was driven by a flexible drive from my adjacent D649 which just so happened to have a shaft which rotated at 240 rpm and the correct direction. The IOC was wrong, producing 3 times the paper feed but at least images were produced. A few more modifications and the IOC was about right and produces quite good results. Obviously not as good as Les Curringtons but instant, they appear before your very eyes!
One final comment on the Yagi, I shall have to write it up, but not before we've sold all the dishes and we already look like having to re-order them. Have we sold 100 already?

I look forward to meeting you at the forthcoming rallies etc.

Till then best wishes,

Henry,

INFORMATION REQUESTED:

Can anyone supply any information on the BURROUGHS DEX 1100 Fax machine please.

Telephone Tom (Leicester) 0533 607681
- reverse the charges.

Minutes of Remote Imaging Group AGM. 26th April 1987.
Held at the RSGB Sandown VHF convention.

14 Members were present.
8 Committee Members were present.

The Chairman commented on the membership figures, which had reached over 900 in 1986 and renewals were coming along well.

The Treasurer presented the accounts to the members present. An explanation was given as to why the accounts were not audited. This was in the main due to the way in which the way transactions at rallies were recorded. This meant that certain sales could not be accounted for.

The treasurer then asked the floor for any questions relating to the accounts. There were none.

The Chairman thanked the treasurer for his services and announced on his behalf that although the treasurer wished to remain on the committee he wished to resign his post as treasurer.

The Chairman announced that at a previous committee meeting Peter Brazier had agreed to take the post of Treasurer.

The Secretary then commented on the state of the correspondence and apologised for the delays caused in replies to letters.

The Secretary commented on the products RIG sold. He added that these pay for the expenses of coming to rallies and keeping RIG in a good public profile.

The Secretary reported that the rallies had gone well averaging one per month through the season. He apologised that RIG had not gone north for any rallies but we hope to do something about this in the future.

The Secretary reported on the membership which had recovered well after the new year and he passed his thanks to Des Watson for handling the membership secretaryship. The amount of mail being handled by Des now means we have our own box in his local post office.

The Secretary then reported that the main problems of newsletter production had been overcome with the purchase of a daisywheel printer. A typist is being paid to put the copy in. The problem of copy was mentioned and the Secretary asked for any contributions for the newsletter to be sent to him.

It was then suggested by the Secretary that in order to expand and enhance the scope of the newsletter a regular spot on satellite TV be entered in the newsletter. No adverse comments were received about this.

The Chairman then took the floor. It was suggested that as all committee members were willing to be re-elected they should be elected onblock. This was agreed with the exception of Bob Smith, who had only attended one committee meeting and had not been heard of since. This was Proposed by G4WDF and seconded by G3YFQ. This was accepted by a unanimous show of hands.

The Chairman then stated that the committee needed to expand if it were to be able to cope with the high work load and asked the floor if anyone would consider joining the committee. Stan Ames put himself forward. This was proposed by G4WDF and seconded by G3YFQ. His appointment to the committee was accepted by a unanimous show of hands.

The committee then consisted of the following.
Stan Ames, Dick Boardman, Peter Brazier, Les Currington, Dermot Dobson, Gordon Flemming, Colin Hall, Bob Leggett, Phil Seaford and Des Watson.

Any Other Business.
There was no any other business from the floor.

The Chairman then thanked the members who had attended the meeting.

The meeting closed at 17:53

REMOTE IMAGING GROUP.

Statement of Accounts for the period 17th February 1986 to 31st March 1987.

Expenditure		Income	
RECEIVER PURCHASE	6726.59	CARRIED OVER CASH	63.00
DISH PURCHASE	2679.00	CARRIED OVER BANK	2732.61
NEWSLETTER PRINTING	2105.80	total	2795.61
NEWSLETTER POSTAGE	1020.47	SUBSCRIPTIONS	3678.15
P.C.B. PURCHASE	811.77	P.C.B. SALES	811.77
PRE-AMP PURCHASE	400.00	RECEIVER SALES	7537.53
STANDS AT RALLIES	321.94	RALLY RECEIPTS	1456.10
RECEIVER REFUNDS	130.65	DISH SALES	504.00
TYPING SERVICES	70.00	COMMISSION	419.66
GENERAL POSTAGE	34.71	PRE-AMP SALES	287.00
OFFICE EQUIPMENT	32.19	DONATIONS	14.00
TRAILER HIRE	20.70		14,708.71
COMMITTEEBADGES	14.00		
RETURNED CHEQUE	14.30		
TOTAL EXPENDITURE	14,382,12	TOTAL INCOME	17,504.32

GOODS IN HAND FOR SALE.	2,420.36	UNSOLD GOODS	2,420.36
CASH AT BANK	3,074.39		
CASH IN HAND	47.81		
TOTAL.....	19,924.68	TOTAL....	19,924.68

GORDON FLEMING
HON-TREASURER R.I.G.
7TH APRIL 1987.

MODIFICATION OF THE K401-B FAX MACHINE
FOR METEOSAT/NOAA PART TWO.

Details of modification circuits.

This article gives some details and circuit diagrams for the K401-B modifications. As most of the circuits supplied are quite detailed we have kept their original size so you will find them in the pullout centrefold area.
Editors note: It must be stressed that the circuits given here are only offered as the basis for further development and we look forward to receiving and publishing members comments.

Power supply.

The power supply circuit shown in fig 2 supplies +24v and +/-12v to the modification circuits. T1 needs to be a 12-0-12v or 15-0-15v transformer of at least 50VA rating. Toroidals are best for these modifications since they are compact and high powered for their size. However, try the 'junk box of bits' first. The full winding (ie both windings in series) is rectified by BR1, and is regulated by IC1 and TR1. Note that the '0v ' of the 24v supply must not make contact with the 0v center tap on the transformer, ie don't let the video and motor drive ground connect to the power amplifier ground otherwise you'll be shorting out the 12v supply! IC2 and IC3 proivde + and -12v supplies respectively.

The 24v supply can be shut down by TR2 according to Guy's circuit, but I couldn't get this to work properly on my prototype. In fact I had to disconnect TR2 to get the full power out of the circuit. This is probably due to the "floating ground" problem. I used a relay to simply short out R3, on the regulator circuit, which will then cause the output voltage to drop to very nearly to 0v. As said earlier, these circuits are a guide to further experimentation with Fax machines!

Motor Drive Unit.
This circuit is split into two parts. The drive frequency generator, and the power amplifier. The full circuits are shown on Figs 4a & 4b. Fig 3 shows a block schematic of the motor drive unit.

A high stability crystal oscillator runs at 4.9152MHz. This is divided by 2048 to produce an accurate reference frequency of 2400Hz The 2400Hz tone decoder and phased locked loop tests the external sync input to see if an external 2400Hz tone is connected. If it is, the output from this stage, an NE567, goes low which switches the output from the digital switch through to the external reference frequency available from the NE567 PLL.

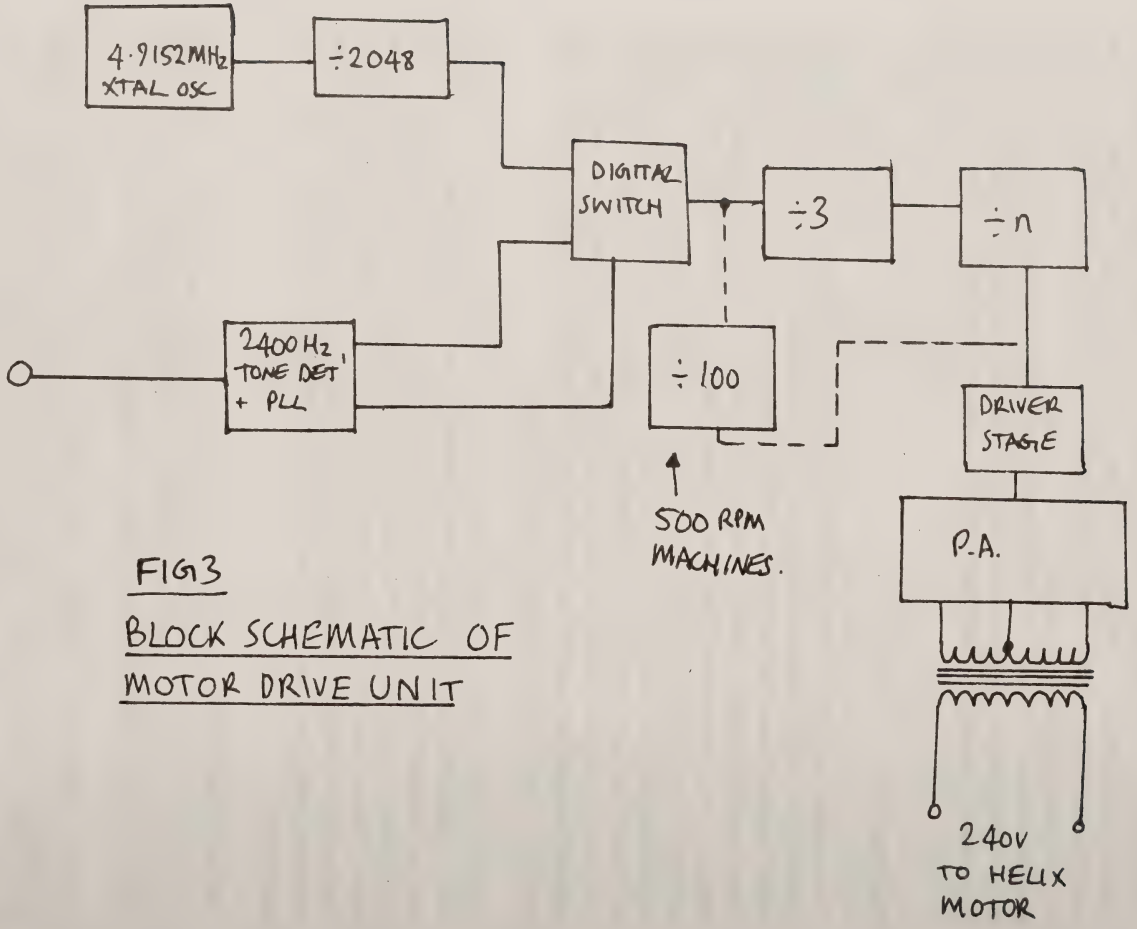

FIG3

BLOCK SCHEMATIC OF MOTOR DRIVE UNIT

If the external sync fails for some reason, the system switches over to the internal frequency source.

The 2400Hz is divided by three and then divided again using a 4024 to get the desired "mains" frequency drive to the helix motor. (For 500 RPM machines, simply divide by 100 using two 4017s.)

The power amplifier stage consists of a class A driver whose collector load is an LT44 audio driver transformer (Guy specifies a TT4 but the LT44 works quite happily). The primary of this transformer can be tuned by a capacitor. The push-pull stage consists of two TIP121s (or TIP122s or TIP110s - they all seem to work) driven in antiphase from the LT44 centre tapped secondary winding. Thermal feedback to reduce the transistors bias in the event of possible thermal run-away is provided by a small silicon diode mounted close to the power transistors. Depending upon what type of transistor is used, the bias must be ajusted so that the transistors just cut off. I can assure you that if you don't do this you will end up with a little TO220 shaped thing emitting great plumes of smoke! I speak from past experiences! The supply to the PA should be kept below 30v. The exact voltage depends on the drive level to the PA. Either the drive can be ajusted or the supply level lowered until the output from the step-up transformer is 240v.

The step-up transformer can be a 12-0-12v 50 VA transformer like the power supply transformer. Efficiency is important here, so a toroidal transformer is highly recommended. However, in this case, nothing more than 50 VA should be used, because a higher power transformer takes more current, and anyway, the motor is not as powerful as 100 W! For 115v motors, a 25-0-25v transformer can be used, or even a 20-0-20v providing the power amplifier supply is suitably adjusted. This is where experimentation is really necessary.

Video Amplifier Circuits:

As explained earlier, the K401-B's video circuits are useless for satellite pictures. However, if you manage to get a K401-CH, all you need to do is to build a motor drive unit and its PSU as described earlier (the CH machine does not have provision for the external motor drive), and may be a few mods to add the final touches to the grey scale (such as gamma correction) and video inversion.

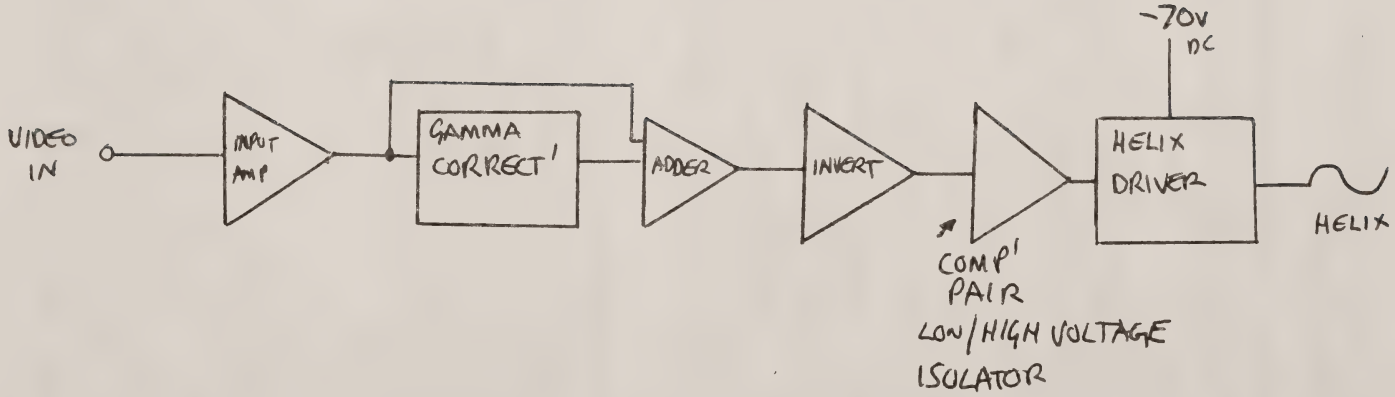

FIG 5 VIDEO CIRCUIT BLOCK SCHEMATIC

The K401-B however, needs a complete replacement of video circuits. This is not the problem it may seem. The cost of a new video circuit is low and you have direct demodulated video input which means that any video processor circuits to be enhance images can be easily added between frame store and FAX printer if desired without having to demodulate the 2400Hz video. The FAX printer is like a sort of TV monitor in that it is direct video, sync pulses and all!

Fig 5 shows the block schematic and Fig 6 the circuit for the video circuit. The input is buffered and then fed to a simple gamma correction circuit which uses a special 1N4311 correction diode. This circuit compensates (up to a certain extent) for the nature of the FAX machine printing medium. Further buffering and an inverting stage provide the correct input to the marking amplifier. The input to the marking amplifier is approx -2v for white and 0v for a full black.

The marking amplifier consists of a long tailed pair isolator, emitter follower and a constant current source which drives the helix. The long tailed pair serves to isolate the low voltage output from the op-amp from the -70v plus for markings, but yet accurately relays changes in the low voltage to changes in high voltage. This circuit also inverts the video so that a low level video signal (black) gives a high voltage at the input to the emitter follower (an MJE340), and so causing black marking of the electrolytic paper. The emitter follower sets the current to be supplied to the helix by the constant current source, by controlling the voltage on VT2 base. The constant current source is already in existence on the FAX machine electronics as VT2, bolted onto the chassis.

All that has to done to effect the video modification is to build up the simple circuit on a PCB (or veroboard) and completely disconnect the VT2's base from the rest of the FAX machine's circuit and reconnect it into the video circuit. (see full modification details in part 3 coming next.)
Fig 6. shows the complete video circuit.

Finally, my apologies for those who have sent me discs for copies of the weather data processing programs. RIG 5, page 22.
I never expected to receive the response I got, and due to my school work (which naturally becomes before hobbies) I have not had time to reply. However I can assure you will get the programs eventually.

Adrian Nash, G4ZHZ

WX PUBLICATIONS

By special arrangements with the NRSC's agents, I am able to make some superb colour prints and posters of satellite images available to RIG members. All pictures are prepared by the RAE at Farnborough from HRPT and Landsat imagery.

POSTERS.

	sizes in millimeters	
The Third Planet. Meteosat Whole Disc. Natural colour	400x600	£2.50
British Isles. Landsat mosaic. Natural colour.	480x710	£4.45
Europe by Satellite. NOAA HRPT. Cloud free natural colour.	590x780	£4.95
Isle of Lewis. Landsat	660x810	£6.50
London. Landsat. (as seen on East Enders!)	530x650	£4.95

PRINTS.

All prints available in two sizes....	240x240	£9.75
	480x480	£19.50

Full colour, gloss-unbelievable resoloution-up to 200 million pixels per picture!

Whole disc. Meteosat
British Isles. False colour Landsat.
British Isles. Natural colour Landsat.
Ireland False colour.
Ireland Natural colour.

GLOBES

Inflatable ! Use it on beach or in shack	£4.95
Giant inflatable	£24.00

BOOKS

Sourcebook of Remote sensing: D.J. Carter. A detailed guide to services, products, facilities, publications relevant to sensing. Destined to become the RIG bible! Hardback £5.00

Weather Satellite Reception: Chris Hornby. A step by step guide for the enthusiasts and teachers setting up a weather satellite station. Ring bound £9.75

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J.C.Hornby G4RAK West Wools,Portland,Dorset DT52EA.
phone0305 822753.

Russian Weather Satellite Scene.

Met 2-14 86.039A 137.85 MHz.

During the period 12th-30th March we were rewarded with some fantastic pictures of Scandinavia; the snow and frozen lakes were some of the best pictures ever recorded. All Scandinavia was enjoying a period of cloud free sky, the snow and ice showing up in great detail all the mountains and fjiords. If 2-14 had not been suffering from faulty exposure control of the optical system superb pictures would have been obtained from Norway to the Black Sea.
Met 2-14 has now drifted into a very early morning pass, and by the time you receive this news letter will be in late afternoon ascending pass around 16:00 hrs.

Met 2-15 87-01A 137.85 MHz

Good pictures are still being received with no sign of any sync trouble; maybe all the trouble which plagued this series of weather satellites has been cured.

Met 3-1 85-100A

No pictures have been seen from this Meteor since drifting into an afternoon pass in April. It was possibly decided to switch of Meteor 3-1 after Meteor 2-15 became fully operational as both satellites were on a similar orbit. I shall miss its long range pictures from its much higher orbit of 1230 Km; interesting pictures were obtained over Greenland and the North Pole during last summer. May we soon look forward to a new Met 3-02 launch.

Met 30 80-51A 137.02 MHz
Met 30 still gives excellent coastal definition but generally the pictures are of poor quality.

Cosmos 1766 86-55A 137.4 MHz

Radar pictures are transmitted most days and during April very good orbits over the Chernobyl area were transmitted.
Very few orbits have been seen in the UK west of 12 degree longitude. The pictures alongside the radar scan shows very little detail; any information on what this picture could be used for would be appreciated.

KEPLER ELEMENTS provided by Mary Finean
EARTH SATELLITE RESEARCH UNIT, UNIVERSITY OF ASTON

	MET 3/1 137.85 MHz 85-100 A	MET 2/14 137.85 MHz 86-039 A	MET 1/30 137.06 MHz 80-051
EPOCH OF DATA	87138.00828335	87104.15608879	87032.24274672
ACCELERATION	0.00000005	0.00000006	0.00001167
REV NO	7533	4450	36176
INCLINATION	82.5499	82.5417	97.7278
R. A. NODE	53.9776	158.3210	121.5933
ECCENTRICITY	0.0021039	0.0016295	0.0041614
ARC OF PERIGEE	42.7950	80.9713	259.7781
MEAN ANOMALY	317.4802	279.3299	99.8715
MEAN MOTION	13.16924584	13.83750606	14.97881637

	COSMOS 1766 137.4 MHz 86-55 A	NOAA 9 137.62 MHz 84-123 A	NOAA 10 137.50 MHz 86-73 A
EPOCHOFDATA	87138.03479667	87106.14552859	87107.56846955
ACCELERATION	0.00000089	0.00000101	-0.00000204
REV NO	4317	12056	3012
INCLINATION	82.5265	99.0436	98.7209
R. A. NODE	19.9496	71.2782	138.7170
ECCENTRICITY	0.0025719	0.0016519	0.0014374
ARS OF PERIGEE	53.9001	23.8947	27.0757
MEAN ANOMALY	306.4589	336.2993	333.1165
MEAN MOTION	14.73490293	14.11488304	14.22495513

	MET 2/15 137.85 MHz 87-001 A
EPOCH OF DATA	87138.036276043
ACCELERATION	0.00000006
REV NO	1836
INCLINATION	82.4699
R. A. NODE	44.1738
ECCENTRICITY	0.0011730
ARG OF PERIGEE	230.7275
MEAN ANOMALY	129.2844
MEAN MOTION	13.83559269

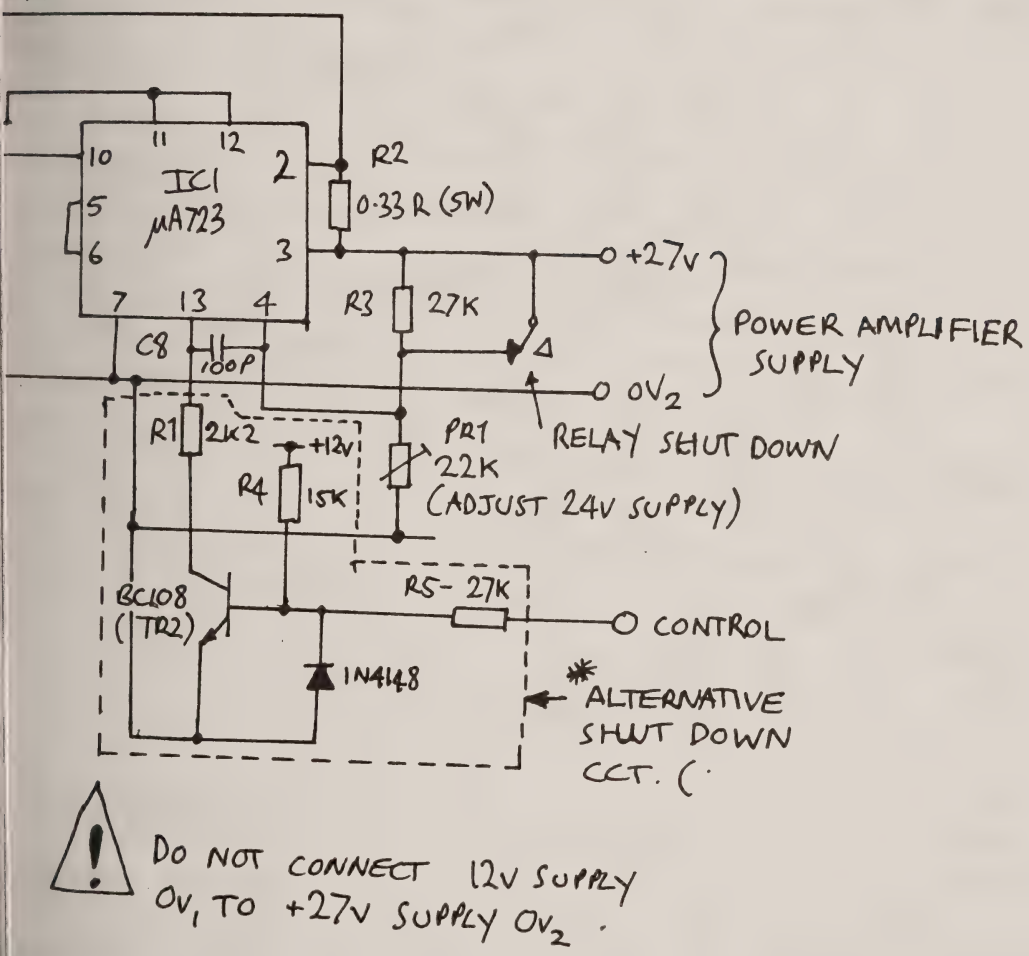
Due to holidays at ESRU not all the data was available for this issue. MET 2/14 was taken from the NOAA bulletin board and MET 1/30 has not been changed.

IG2

MODS P.S.U.

12 / G8 NFU)

ED ON A
NK



Do not connect 12v supply $0v_1$ to +27v supply $0v_2$.

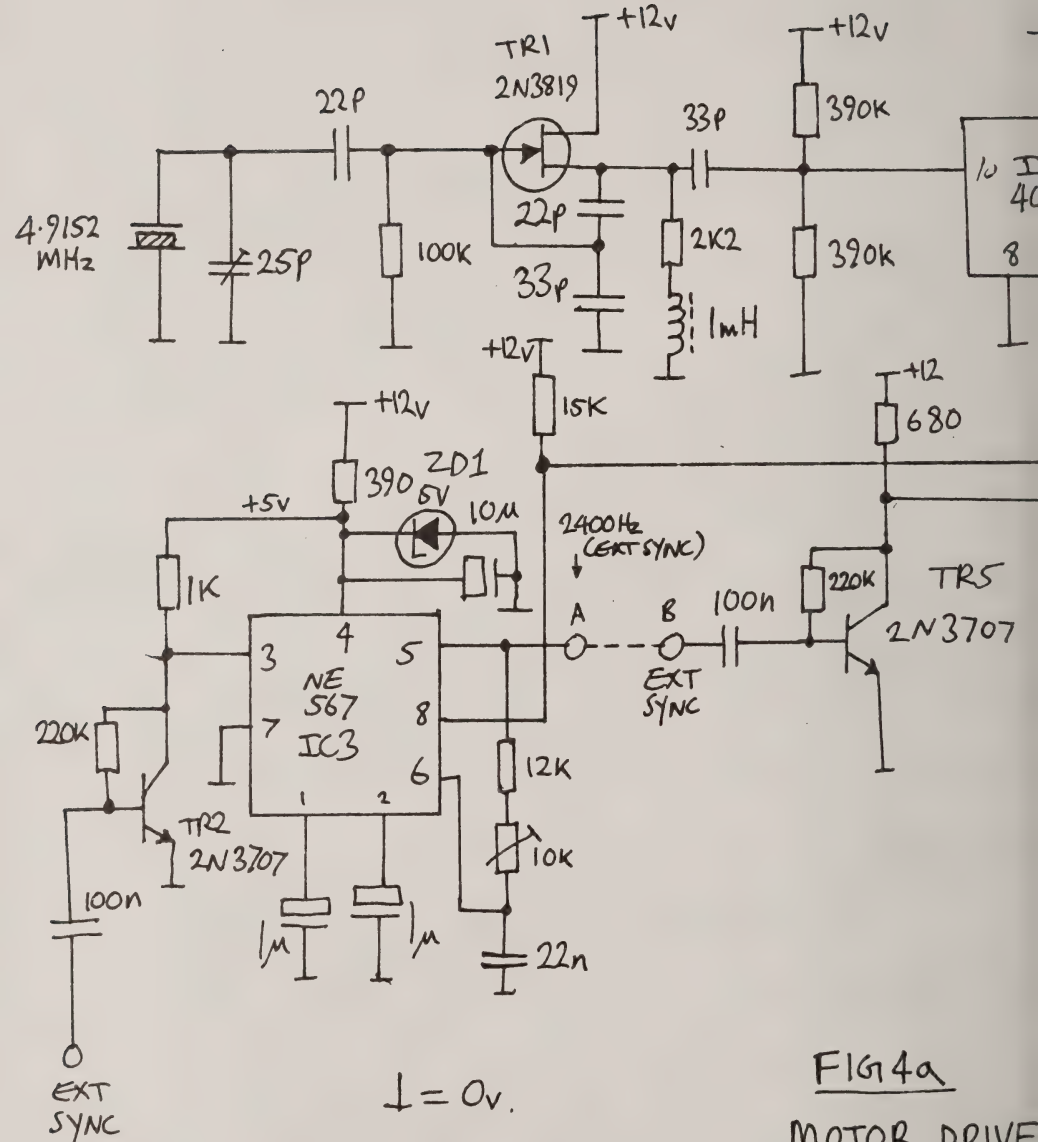


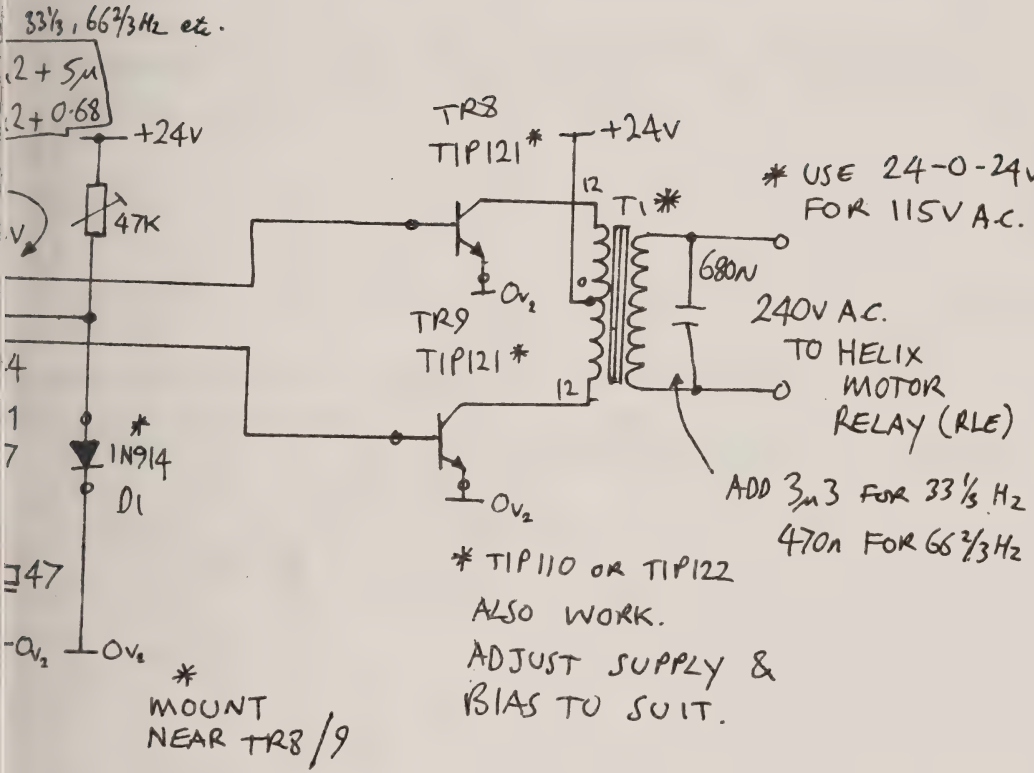
FIG 4a

MOTOR DRIVE

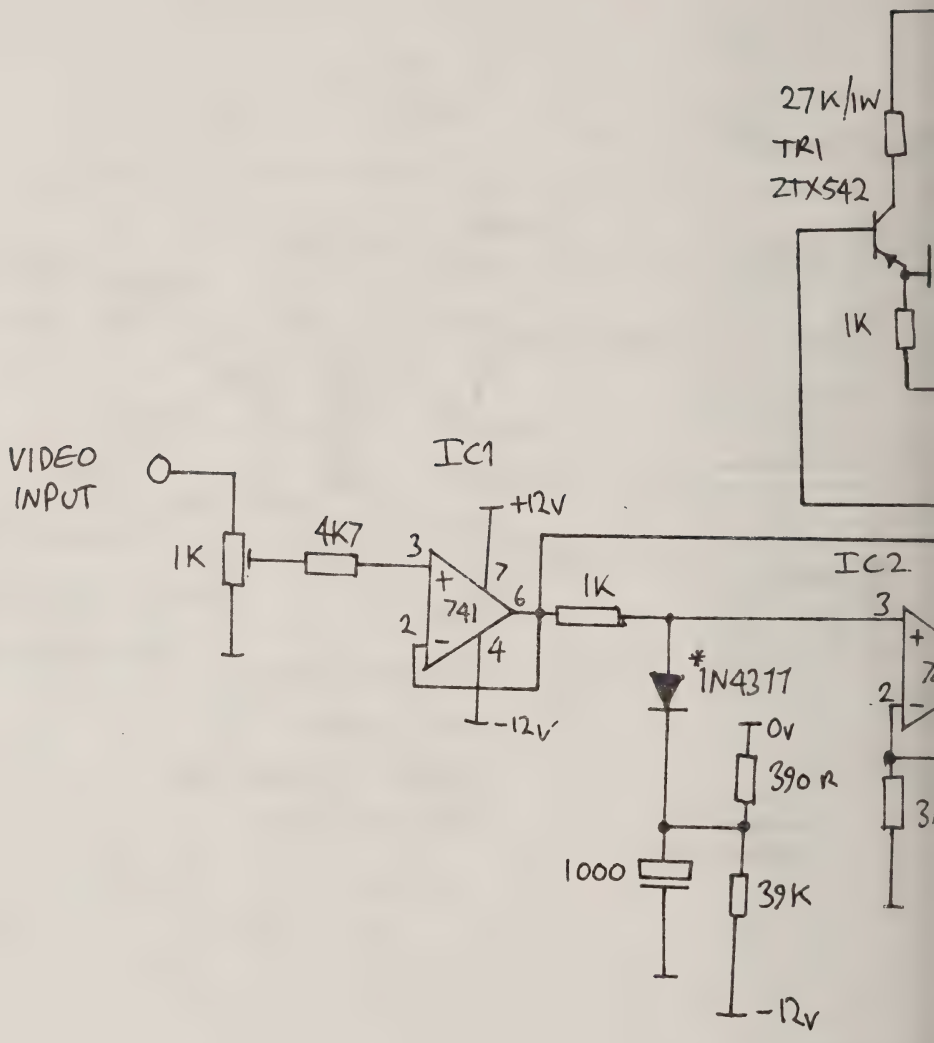
DRIVE FREQU

GENERATOR

(G8NFU)


33⅓, 66⅔Hz etc.
2+5μ
2+0·68
+24V
47K
4
1
7
IN914
D1
47
0V₂
0V₂
*
MOUNT
NEAR TR8/9
TR8
TIP121*
+24V
12
T1*
TR9
TIP121*
0V₂
12
680N
240V A.C.
TO HELIX
MOTOR
RELAY (RLE)
ADD 3μ3 FOR 33⅓ Hz
470n FOR 66⅔Hz
0V₂
* TIP110 OR TIP122
ALSO WORK.
ADJUST SUPPLY &
BIAS TO SUIT.
* USE 24-0-24V
FOR 115V A.C.

AMPLIFIER
U)



* SPECIAL
GAMMA CORREC
DIODE.

F
V
(G

REMOTE IMAGING GROUP (R. I. G.)

PREDICTIONS AND STATUS ON NOAA WEATHER SATELLITES

NOAA "9" & "10" STATUS INFORMATION DATELINE 06/JUN/87

NOAA 9 (Launched 1984). Lunchtime/early afternoon satellite, with the summer with us, and the sun nice and high, good pictures are being received. Noaa 9 has had some problems with the AVHRR system, but all has stabilised again.

NOAA 10 All functioning normally as far as we know.

Noaa 9 reference orbit used for predictions 2713 15:31:25z eqx 004.28 deg. June 1st.

Noaa 10 reference orbit 3657 20:47:44z eqx 018.19 deg. June 1st.

All prediction times are ALL GMT, and are usually within +/- 30 secs and +/- .5° at the start and +/- 3 mins and +/- 3° at the end of the table.

QUICK CALC FOR AOS, DIRECTION & ELEVATION FINDER

NORTHBOUND SATELLITES				:	SOUTHBOUND SATELLITES			
EQX	ADD MINS	AZ	EL	:	EQX	ADD MINS	AZ	EL
330°	9	131	1	:	170°	29	020	0
	16	056	33	:		36	091	37
	23	350	0	:		43	171	2
340°	8	151	1	:	180°	29	016	2
	15	075	63	:		36	118	75
	22	347	2	:		43	192	2
350°	7	171	0	:	190°	28	012	0
	15	284	63	:		35	308	55
	22	342	0	:		42	212	3

TIP. When the UK is likely to be covered in cloud, and you would like to know when the UK is in the picture, then add apprx 13 1/2* mins to EQX (Northbound satellites), the top line of the picture will then be an eastish/westish line cutting through the Bay of Biscay about 1/2 way up, if you then stop the picture 4 mins 15 secs later, then somewhere on the screen will be the UK. (* about right for EQX at 345° which is a good UK overhead pass).

(c2)

NOAA '10' 137.50MHZ PERIOD 101.2876 INC 25.3216044 DEG

1/07 187 08:07	1/08 194 08:35	29/08 344 18:35	29/09 199 08:55
2/07 182 07:45	1/08 346 18:42	30/08 187 08:05	30/09 194 08:33
3/07 176 07:23	2/08 189 08:13	31/08 181 07:43	30/09 346 18:41
4/07 196 08:42	2/08 341 18:20	1/09 176 07:21	1/10 188 08:11
5/07 191 08:20	3/08 183 07:51	2/09 196 08:40	1/10 340 18:19
5/07 343 18:28	4/08 178 07:29	3/09 190 08:18	2/10 183 07:49
6/07 185 07:58	5/08 172 07:07	3/09 342 18:26	3/10 177 07:27
7/07 180 07:36	5/08 198 08:48	4/09 185 07:56	4/10 172 07:05
8/07 174 07:14	6/08 192 08:26	5/09 179 07:35	4/10 197 08:46
9/07 194 08:34	6/08 344 18:34	6/09 174 07:13	5/10 191 08:24
9/07 346 18:41	7/08 187 08:04	6/09 199 08:54	5/10 343 18:32
10/07 189 08:12	8/08 181 07:42	7/09 193 08:32	6/10 186 08:02
10/07 341 18:19	9/08 176 07:20	7/09 345 18:40	7/10 180 07:40
11/07 183 07:50	10/08 195 08:39	8/09 188 08:10	8/10 175 07:18
12/07 178 07:28	10/08 347 18:47	8/09 340 18:18	9/10 195 08:38
13/07 172 07:06	11/08 190 08:17	9/09 182 07:48	9/10 347 18:45
13/07 197 08:47	11/08 342 18:25	10/09 177 07:26	10/10 189 08:16
14/07 192 08:25	12/08 184 07:55	11/09 197 08:45	10/10 341 18:23
14/07 344 18:33	13/08 179 07:33	12/09 191 08:23	11/10 184 07:54
15/07 186 08:03	14/08 173 07:11	12/09 343 18:31	12/10 178 07:32
16/07 181 07:41	14/08 199 08:53	13/09 186 08:01	13/10 173 07:10
17/07 175 07:19	15/08 193 08:31	14/09 180 07:39	13/10 198 08:51
18/07 195 08:38	15/08 345 18:39	15/09 175 07:17	14/10 193 08:29
18/07 347 18:46	16/08 188 08:09	16/09 195 08:37	14/10 345 18:37
19/07 190 08:16	16/08 340 18:17	16/09 347 18:44	15/10 187 08:07
19/07 342 18:24	17/08 182 07:47	17/09 189 08:15	16/10 182 07:45
20/07 184 07:54	18/08 177 07:25	17/09 341 18:22	17/10 176 07:23
21/07 179 07:32	19/08 197 08:44	18/09 184 07:53	18/10 196 08:43
22/07 173 07:10	20/08 191 08:22	19/09 178 07:31	19/10 190 08:21
22/07 199 08:52	20/08 343 18:30	20/09 173 07:09	19/10 342 18:28
23/07 193 08:30	21/08 186 08:00	20/09 198 08:50	20/10 185 07:59
23/07 345 18:37	22/08 180 07:38	21/09 192 08:28	21/10 179 07:37
24/07 188 08:08	23/08 175 07:16	21/09 344 18:36	22/10 174 07:15
24/07 340 18:16	24/08 194 08:36	22/09 187 08:06	22/10 199 08:56
25/07 182 07:46	24/08 346 18:43	23/09 181 07:44	23/10 194 08:34
26/07 177 07:24	25/08 189 08:14	24/09 176 07:22	23/10 346 18:42
27/07 196 08:43	25/08 341 18:21	25/09 196 08:41	24/10 188 08:12
28/07 191 08:21	26/08 183 07:52	26/09 190 08:20	24/10 340 18:20
28/07 343 18:29	27/08 178 07:30	26/09 342 18:27	25/10 183 07:50
29/07 185 07:59	28/08 172 07:08	27/09 185 07:58	26/10 177 07:28
30/07 180 07:37	28/08 198 08:49	28/09 179 07:36	27/10 172 07:06
31/07 174 07:15	29/08 192 08:27	29/09 174 07:14	27/10 197 08:47

All morning passes are southbound, all evening passes are northbound.

We have included some evening passes, which are about overhead UK.

NOAA '9' 137.62MHZ PERIOD 102.076472 INCR 25.5173811 DEG

1/07 332 13:27	2/08 346 14:26	1/09 340 14:04	30/09 336 13:53
2/07 355 14:58	3/08 190 04:02	2/09 184 03:41	1/10 181 03:30
3/07 352 14:47	3/08 343 14:15	2/09 337 13:53	1/10 334 13:42
4/07 349 14:36	4/08 187 03:51	3/09 181 03:30	2/10 331 13:32
5/07 347 14:26	4/08 340 14:04	3/09 334 13:42	3/10 354 15:03
6/07 344 14:15	5/08 185 03:41	4/09 332 13:31	4/10 351 14:52
7/07 188 03:51	5/08 338 13:53	5/09 354 15:02	5/10 348 14:41
7/07 341 14:04	6/08 182 03:30	6/09 352 14:52	6/10 345 14:30
8/07 185 03:40	6/08 335 13:42	7/09 349 14:41	7/10 190 04:06
8/07 338 13:53	7/08 332 13:31	8/09 346 14:30	7/10 343 14:19
9/07 182 03:29	8/08 355 15:02	9/09 190 04:06	8/10 187 03:56
9/07 336 13:42	9/08 352 14:51	9/09 343 14:19	8/10 340 14:08
10/07 333 13:31	10/08 349 14:40	10/09 187 03:55	9/10 184 03:45
11/07 330 13:20	11/08 347 14:29	10/09 341 14:08	9/10 337 13:57
12/07 353 14:51	12/08 344 14:19	11/09 185 03:44	10/10 181 03:34
13/07 350 14:40	13/08 188 03:55	11/09 338 13:57	10/10 334 13:46
14/07 347 14:29	13/08 341 14:08	12/09 182 03:34	11/10 332 13:35
15/07 345 14:18	14/08 185 03:44	12/09 335 13:46	12/10 354 15:06
16/07 189 03:55	14/08 338 13:57	13/09 332 13:35	13/10 352 14:55
16/07 342 14:07	15/08 183 03:33	14/09 330 13:24	14/10 349 14:45
17/07 186 03:44	15/08 336 13:46	14/09 355 15:06	15/10 346 14:34
17/07 339 13:56	16/08 333 13:35	15/09 352 14:55	16/10 190 04:10
18/07 183 03:33	17/08 330 13:24	16/09 350 14:44	16/10 343 14:23
18/07 336 13:46	18/08 353 14:55	17/09 347 14:33	17/10 187 03:59
19/07 334 13:35	19/08 350 14:44	18/09 344 14:22	17/10 341 14:12
20/07 331 13:24	20/08 347 14:33	19/09 188 03:59	18/10 185 03:48
21/07 354 14:55	21/08 345 14:22	19/09 341 14:12	18/10 338 14:01
22/07 351 14:44	22/08 189 03:59	20/09 185 03:48	19/10 182 03:37
23/07 348 14:33	22/08 342 14:11	20/09 338 14:01	19/10 335 13:50
24/07 345 14:22	23/08 186 03:48	21/09 183 03:37	20/10 332 13:39
25/07 189 03:59	23/08 339 14:00	21/09 336 13:50	21/10 330 13:28
25/07 343 14:11	24/08 183 03:37	22/09 333 13:39	21/10 355 15:10
26/07 187 03:48	24/08 336 13:49	23/09 330 13:28	22/10 352 14:59
26/07 340 14:00	25/08 334 13:39	24/09 353 14:59	23/10 350 14:48
27/07 184 03:37	26/08 331 13:28	25/09 350 14:48	24/10 347 14:37
27/07 337 13:49	27/08 354 14:59	26/09 347 14:37	25/10 344 14:26
28/07 181 03:26	28/08 351 14:48	27/09 345 14:26	26/10 188 04:03
28/07 334 13:38	29/08 348 14:37	28/09 189 04:03	26/10 341 14:15
29/07 331 13:27	30/08 345 14:26	28/09 342 14:15	27/10 185 03:52
30/07 354 14:59	31/08 189 04:03	29/09 186 03:52	27/10 339 14:05
31/07 351 14:48	31/08 343 14:15	29/09 339 14:04	28/10 183 03:41
1/08 349 14:37	1/09 187 03:52	30/09 183 03:41	28/10 336 13:54

All morning passes are southbound, all afternoon passes are northbound.

We have included some morning passes, which are about overhead UK.

(c4)

METEOSAT TRANSMISSIONS CHANNEL 1 (1694.5MHZ)

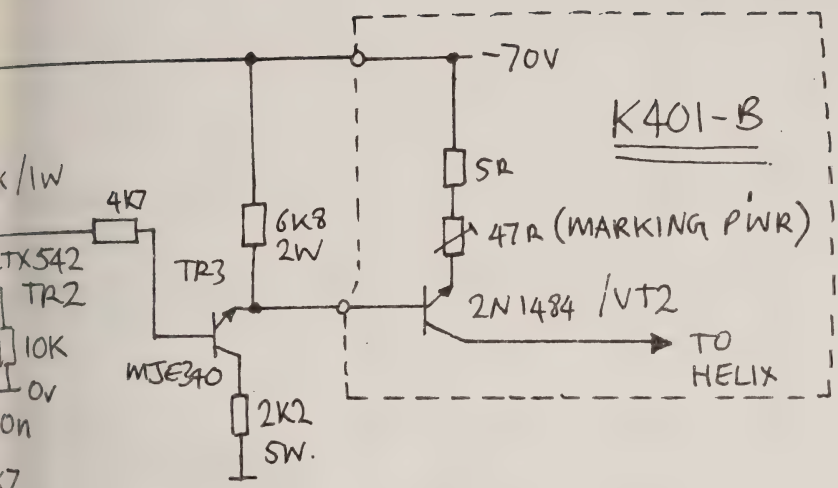
	TIME GMT											
MIN	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
2	E3					E8	E3				C3D:	C9D:
6						E9					C4D:	
10	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2
14	D1	D1	D1	D1	D1	D1	CO2:	CO2:	CO2:	CO2:	CO2:	CO2:
18	D3	D3	D3	D3	D3	D3	CO3:	CO3:	CO3:	CO3:	CO3:	CO3:
22	D4		T	D4	E1	A	D1	C5D:	T	D1	C5D:	A
26	D5			D5	E2		D3	C6D:		D3	C6D:	
30	D6			D6	E3		D4	D7		D4	D7	
34	D7		R	D7	E4	R	D5	D8	R	D5	D8	R
38	D8		R	D8	E5	R	D6	D9	R	D6	D9	R
42	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2
46	D9	D1	D1	D9	D1	D1	CO2:	CO2:	CO2:	CO2:	CO2:	CO2:
50	D1	D3	D3	D1	D3	D3	CO3:	CO3:	CO3:	CO3:	CO3:	CO3:
54	D3			D3	E6	E1	C3D:	C8D:	T	C1D:	C7D:	E1
58					E7	E2	C2D:	C9D:	T	C2D:	C8D:	E2

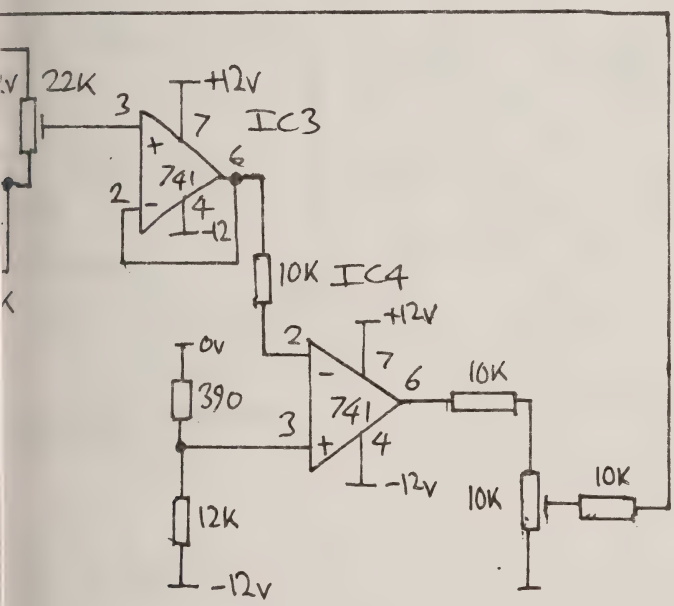
MIN	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
2	E3	C3D:	C9D:		C3D:	C9D:	E3		E8			
6		C4D:			C4D:				E9			
10	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2
14	CO2:	CO2:	CO2:	CO2:	CO2:	CO2:	D1	D1	D1	D1	D1	D1
18	CO3:	CO3:	CO3:	CO3:	CO3:	CO3:	D3	D3	D3	D3	D3	D3
22	D1	C5D:	T	D1	C5D:	A	D4	E1	T	D4		A
26	D3	C6D:		D3	C6D:		D5	E2		D5		
30	D4	D7		D4	D7		D6	E3		D6		
34	D5	D8	R	D5	D8	R	D7	E4	R	D7		R
38	D6	D9	R	D6	D9	R	D8	E5	R	D8		R
42	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2	D2
46	CO2:	CO2:	CO2:	CO2:	CO2:	D1	D9	D1	D1	D9	D1	D1
50	CO3:	CO3:	CO3:	CO3:	CO3:	D3	D1	D3	D3	D1	D3	D3
54	C1D:	C7D:		C1D:	C7D:	E1	D3	E6		D3		E1
58	C2D:	C8D:		C2D:	C8D:	E2		E7				E2

D2, C2, C3, ARE EUROPE

C= VISIBLE LIGHT, D= INFRA-RED, E= WATER VAPOUR, T= TEST PATTERN
A= ADMINISTRATIVE MESSAGE, R= RANGING

If you have channel 2 available then total discs are sent at 00:34, 03.26, 06:14, 09:30, 09:34, 12:38, 13:14, 15:30, 18:14, 21:26, all GMT.





CIRCUIT
/G8NFU)

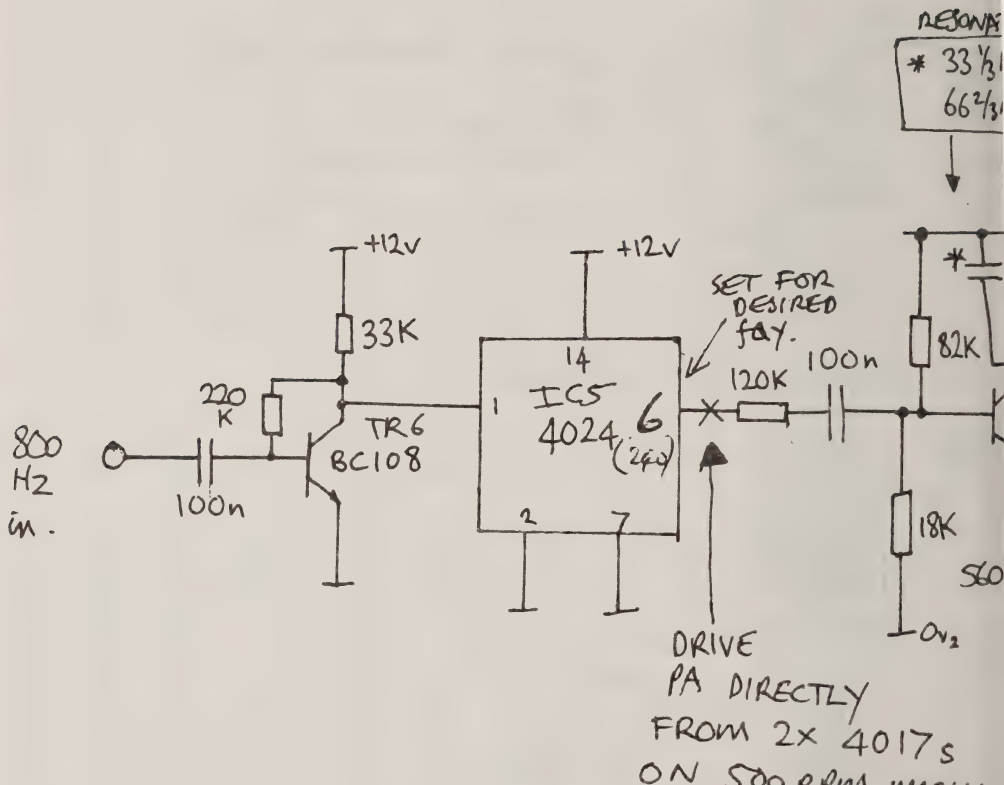
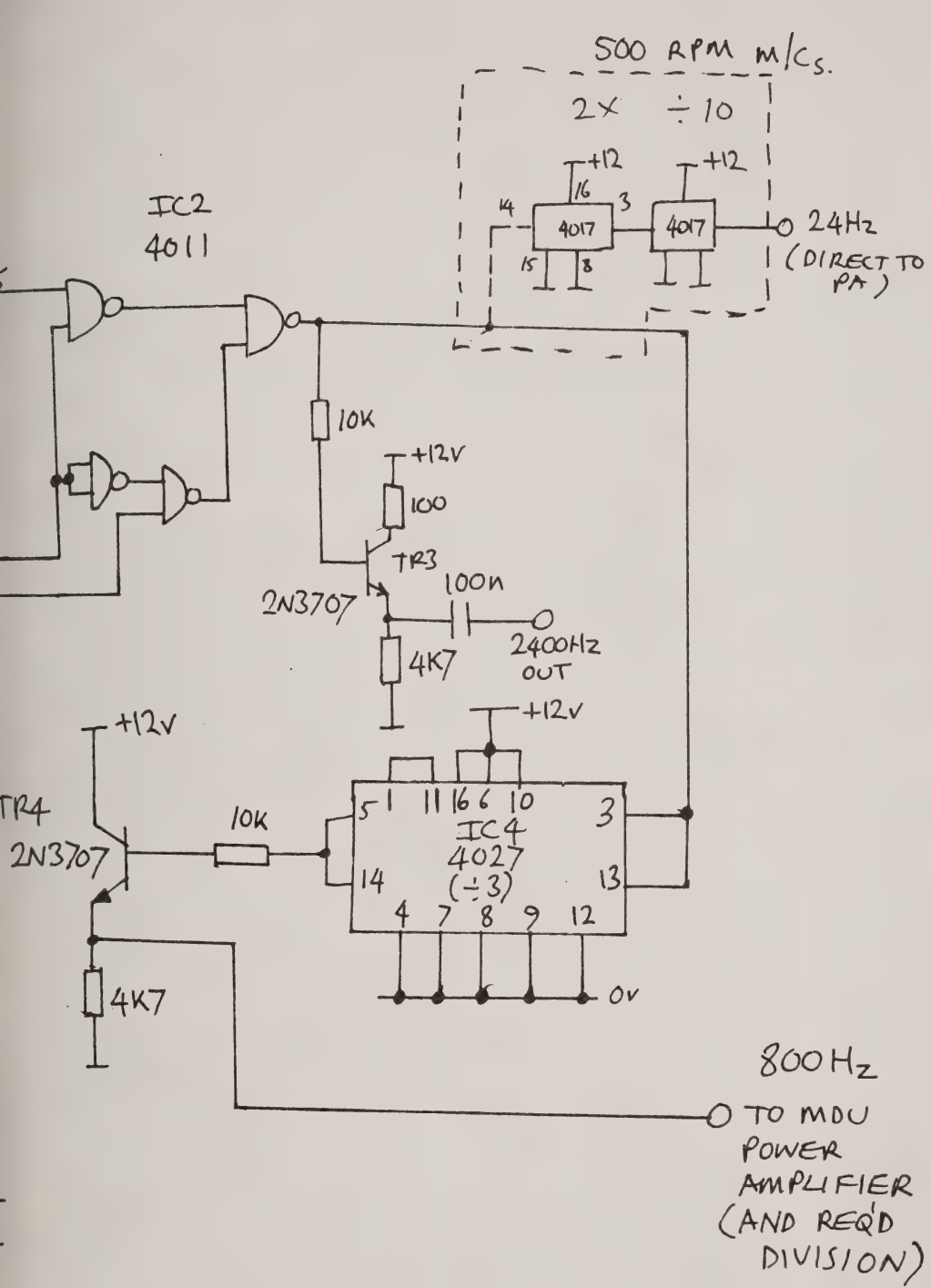
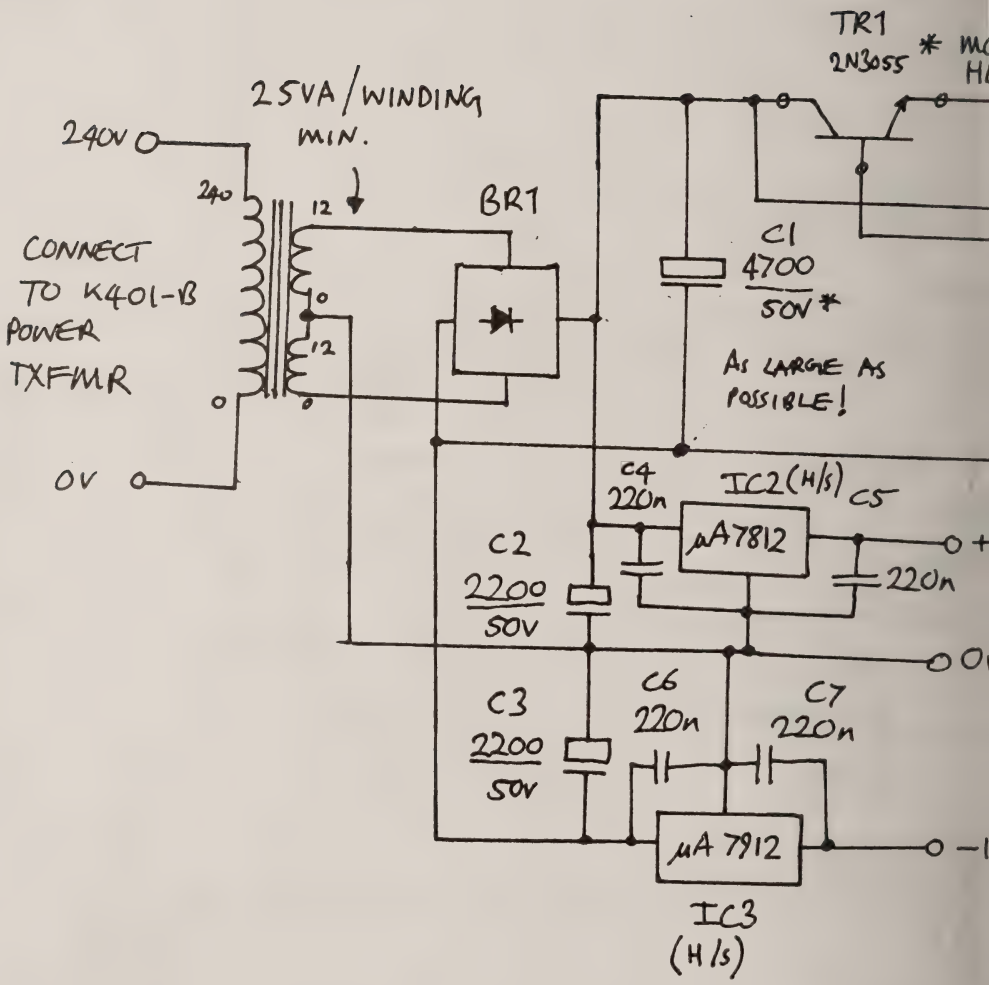

RESONA
* 33⅓
66⅔
+12v
+12v
33K
220 K
TR6 BC108
800 Hz in.
100n
14
IC5 4024 6 (24)
1
2
7
SET FOR DESIRED fqy.
120K
100n
82K
18K
0v
DRIVE PA DIRECTLY FROM 2x 4017s ON 500 RPM MACHIN

FIG4b

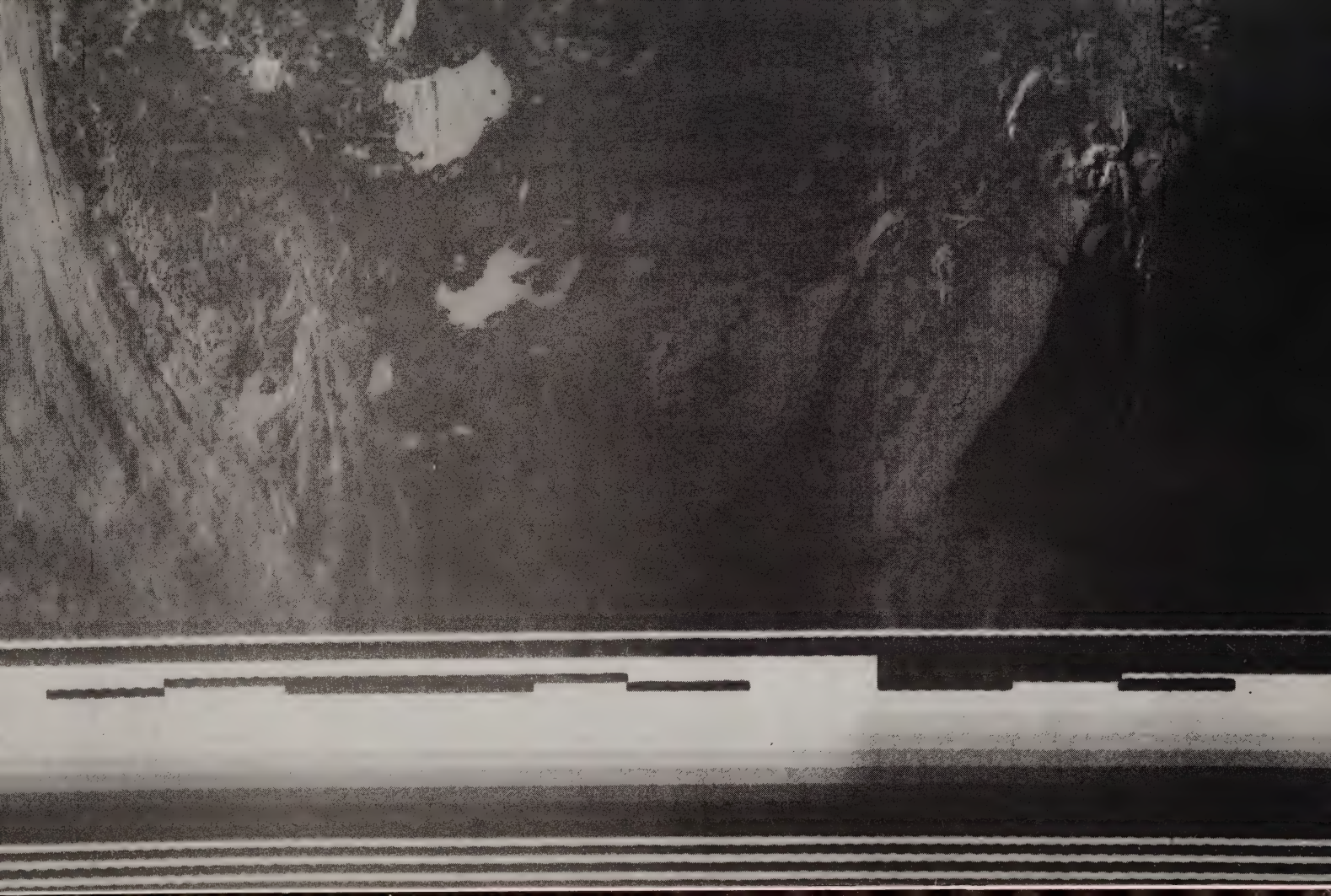

500 RPM m/cs.
2x ÷10
+12
+12
16
14
3
4017
4017
15
8
24Hz
(DIRECT TO PA)
IC2
4011
10K
+12V
100
TR3
2N3707
100n
2400Hz
OUT
4K7
+12V
+12V
TR4
2N3707
10K
5
1
11
16
6
10
3
IC4
4027
(÷3)
14
13
4
7
8
9
12
4K7
0V
800Hz
TO MDU
POWER
AMPLIFIER
(AND REQ'D
DIVISION)

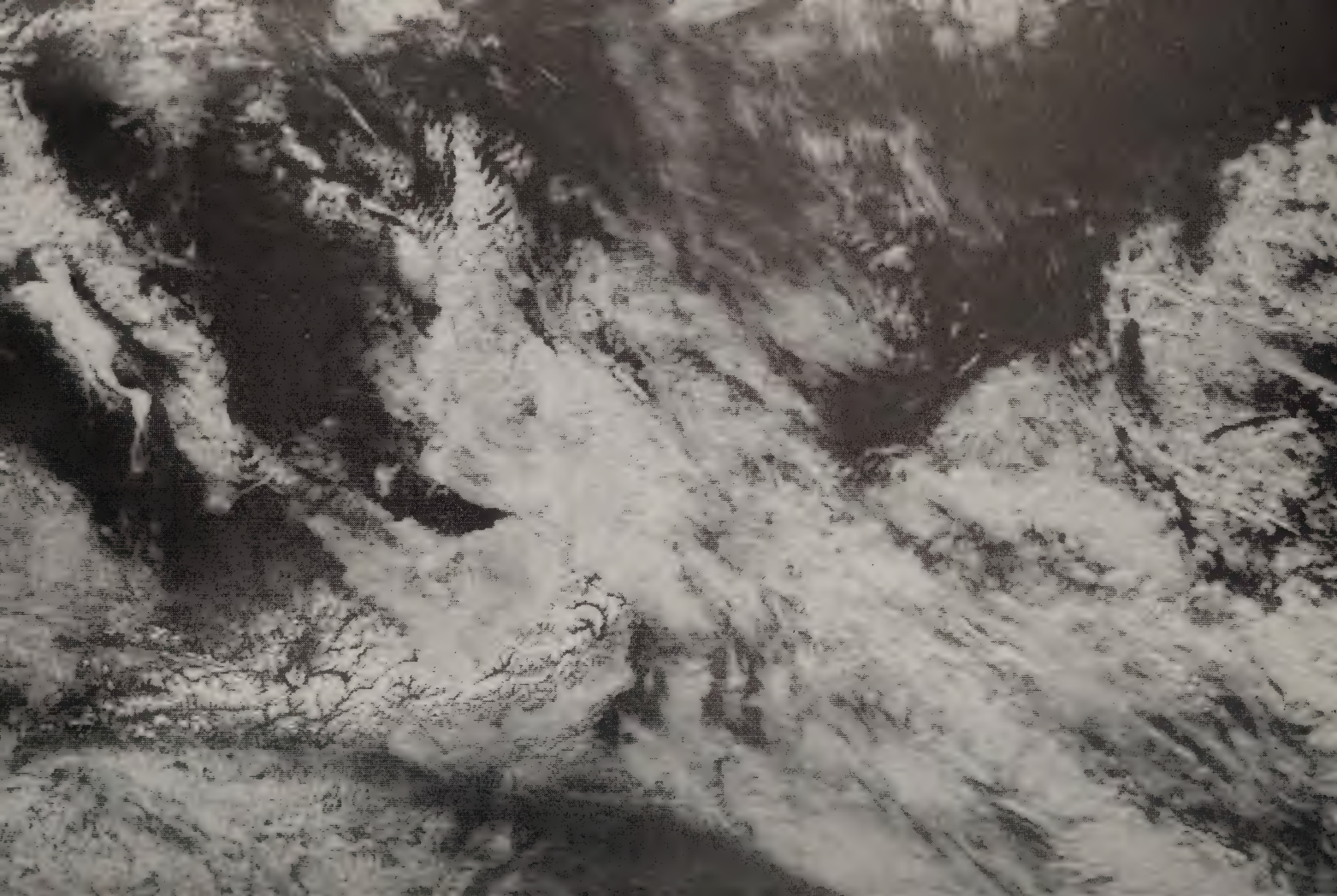
K401-

(



H/S = HEAT SINK





Sights Worth Seeing.
More Observations from Lawrence Harris

Members developing their satellite receiving systems may be interested in this summary of some of the picturesque, and other sights, that are worth looking for. I have found that the pictures available from even moderately well ajusted set ups show far more detail than is decipherable from even very good atlases.

Have a look at Iceland on the first suitable pass in the morning in visible light; usually the best with NOAA 10 but Met 2-14 is ok as well. You can see the range of hills shining very brightly as they catch the sunrise. It is really worth getting up early for, or you can cheat by setting your timer! The evening pass does not produce such dramatic highlighting. On Greenland I have managed to monitor as far North and well beyond Disco Island on the west coast and beyond King W Land in the east. I am still waiting for clear skies to positively identify Newfoundland.

I was greatly surprised to see Mount Etna so clearly on a recent Met 30 pass. The vivid summit was shining very brightly causing me to check my atlas to identify it was Etna. I hope that I never see that one erupt! It would be very bright in the infra-red (ie from NOAA).

Another reason for an early rising is to see the effect of sun glint on the Mediterranean. It is almost as if the water levels were different on either side of Spain. On the west side the Atlantic remains dark, but on the east you can see a very bright sheet of light looking very 3-dimensional as it brightens near the Spanish coastline.

Meteosat must remain high on your list of sources to examine. The C2D and C3D formats are particularly worth looking at.

SUMMARY OF RUSSIAN SATELLITE OBSERVATIONS
PERIOD MARCH TO APRIL.

Met 30:

Continues to provide very good pictures, even stunning on occasions. It doesn't seem to have any panoramic correction ie, the edges of the field are prone to distortion. I have followed it continously as it rises higher above the UK but it never seems to be on after its maximum elevation reaches about 60 degrees above the UK. The late April maximum reached 66 degrees before switch off. The detail that I see during cloudless passes suggests to me that it has a high capability for resolving ground detail.

Met 2/14:
Some very good pictures have been received and one gave a superb picture as far south as Libya with considerable detail, more so than my world atlas. Changes of light level sensitivity were observed on the 28th March 0938z pass; it was also followed down to Mauritania providing superb resoulation. Mention must be made of the 0820z pass on the 4th April which showed the upper Gulf of Bothnia still frozen, the lower section with a large melted area and the eastern Finland area also frozen. The simultaneous picture from Meteosat (CO3) showed lake Lagoda solid. By late April the Lower Gulf was 2/3rds melted.

Met 2/15
Monitored daily for signs of a transmission. Not on up to the 4th April, not monitored 5th but I was called by Adrian (Brixham) for the 1948z pass. Has been on continuously since then. Pictures seem to be rather contrasty and land detail not always easy to identify even when you know it is there. Perhaps my A-D adjuster is not optimally set but I prefer 2/14! seems able to show Norway without problemsthough.

Cosmos 1500: ?
On the third of April at 1631z on 137.10 MHz an APT transmission was observed live and recorded. It lasted about 40 seconds. Checking through possible footprints the only satellite likely was Cosmos 1500.

Cosmos 1766:
25th March 1604z 137.40MHz received pictures previously advised in separate correspondence. Not transmitting during 1734z pass. At 1916z a radar image was received. Adrian had been alerted by me before this pass. No further transmissions were received during the following days despite regular monitoring. Next transmission was on the 2nd of April around 1600z. Pictures again on the 4th of April. No further transmissions have been received, despite many logged hours.

Met 3/1:
Not received any TX this one despite monitoring almost every day.

REVIEW OF THE ICS FAX 1 FACSIMILIE TERMINAL UNIT.
by Bob Leggett G6KMM

The unit comes with a 12 volt connecting cable, 3.5mm jack to jack plug extension connecting a clock battery, it is housed in a plasticised aluminium box with a removable mobile mount.

The front panel has a LCD clock, tuning bar of leds, IOC, RPM, Auto and Start led indicators, together with push buttons for clock/ auto settings,manual start and left/right phasing.

The instruction manual (!) consists of five double sided sheets, and one print sample sheet.

The printer has to be an Epson FX80 compatible, capable of quad density graphics, or the ICS Fax-1a ink jet printer. The printer cable is not supplied, though pinout details are given for the 25 way D connector. (IBM PC printer cable is suitable).

Now with the printer cable connected, a Trio R1000, and as the manual says a long wire aerial as a minimum requirement, the radio was tuned to 3557.4 MHZ lower sideband, the fax signal sounds ok, the unit was then switched on, only to find that the signal disappeared switched off unit signal re-appears. The unit appears to generate an awful lot of hash, more so when the printer cable was connected, another cable was tried, but that gave the same results. Abandon hope and go to another location which has an Icom 720A with a screened cable to an aerial outside.

The same station was selected, and the signal stays this time, with just a little hash, dial 2.2KHz up as the manual and the front panel insists, signal disappears this time without the unit being switched on! Penny drops, the Icom gives correct read out, (so did the Trio R1000 as I found out later), so ignore manufactures instructions to tune 2.2 up, with this equipment.

The unit was manually started but the printer printed nothing but solid black lines. The tuning was altered and slowly the print out became clearer, though not as good as the sample print in the manual. By judicious tuning, acceptable results were obtained, after experimenting for about three days with various stations and tuning, reasonable results were being obtained.

With the unit being expensive, it was a disappointment, the main criticisms are :-

The manual needs to be expanded to take into account different types of receivers, much more information about tuning is badly needed, together with more information about the tuning meter and the IOC and its relationship to the size of printout.

Better screening and more attention is need to the unit to reduce the hash created, it is doubtful if it would pass the American FCC regulations for spurious radio emissions, it is even noticeable 200Khz broadcast receiver, being used in the same room.

It would also be nice to get bigger printouts using the larger printers that are available.

The unit is well made, double sided PCB, with Z80 CPU, Z80 PIO, and 24 pin eprom in 28 pin socket, (for expansion perhaps), together with support chips, surprisingly there RS components insude which leads me to think that this is part of the reason for its price.

Bearing in mind what can be bought for £269.00 , here is one Radio Amateur who will forgo owing one of these, though I would have second thoughts if it were priced around the £135/150 mark, and probably ICS would sell twice as many.

MARKS OUT OF TEN.

Value for money	4	Ease of use	5
Manual	3	Performance	6
Construction	8		

RGL

Editors Note.

In view of the above criticisms we have invited ICS to reply.

Alan Clemmetsen, G3VZJ, Managing director of ICS Electronics replies:

Whilst no product is ever absolutely perfect, we believe that the FAX-1 is a very simple to use, excellent value for money, and above all, prints very good weather maps!

Until now, weatherfax receiving equipment has been very expensive. The cheapest Japanese unit is around £1300, and the cheapest U.K. equipment (similar in concept to the Fax-1) is £720.00. Both prices exclude VAT. Our price of £279.95, for a professionally built unit, with screened boards, including solder resist, is therefore extremely competitive. If your reviewer can purchase the parts to manufacture the Fax-1 at the price he believes we should sell the unit at, I would like to offer him a job as a buyer. He also neglects the several thousands of pounds we had to invest to pay a professional programmer to write this 'state of art' software.

As a result of our competitiveness, the product is selling very well, particularly in Europe and in North America, where it has passed FCC tests (all be it with a few minor changes, which will be incorporated into future productions). With several hundreds of units shipped, customer complaint levels have been minimal.
I believe that the tuning indicator is very easy to use and is one that we have used successfully in other products. Hash is always a problem with any computerised equipment, but we have taken efforts to minimize it in the design of the Fax-1. Very important are:-

- A good aerial
- Good system earthing
- Use of high quality screened cables, particularly for the printer.

For this reason, we are about to offer a very high quality double screened, moulded printer interface cable at a competitive price.

For your information, I am enclosing a copy of a fuller, and more balanced independent product review from Ken Michaelson, G3RDG, together with some print samples.

To be perfectly frank, the reviewer seems to be one of the I want something for nothing , and if I can't get it for nothing , I am going to criticise the hell out of it brigade. We run into them from time to time in this business.

Again, thank you very much for sending us a copy of the review. I don't mind a few bad points being published, but do please try to put a few good ones in too!

Yours sincerely
Alan R Clemmetsen (G3VZJ) , Managing Director

Editors note:
The weather maps enclosed in Alans reply were excellent an easy to read but the weather picture also enclosed was poor. It is extremely difficult to get good grey scales from a matrix printer.

SOME NOTES ON PREDICTIONS

by Grant Dixon.

First of all can I strongly recommend the chapter on" Satellites" in the book " Amateur Radio Software " by John Morris GM4ANB. several programs are given which are ideal for orbital prediction and they give azmuith and elevation from your location... just in case you have a computer controlled beam antenna! This set me thinking about how we receive the signals from these orbiting satellites.

Clearly we can only receive the satellite if it is above our horizon; though there is a possibility of getting a signal when the satellite is just below the horizon by a diffraction effect. Now if we take a horizontal plane through the receiving antenna it is possible that local hilly country will make your "horizon" a few degrees above the theoretical horizon. The satellite must appear over the hill before we get its signal. Some of the more distant satellite passes have a maximum elevation of only a few degrees, so clearly the elevation of a satellite as seen by the receiving antenna is of great interest.

I ran a program to get a set of data giving the maximum elevation for various values of equator crossing longitude (EQX) in steps of 5 degrees. I then wrote a program to plot these values on a neat graph. I have not attempted to draw in the curves.... obviously a figure of 90 degrees elevation is attained when the satellite has an EQX value which takes it directly over the receiver. Also, note that there are several orbits when the satellite is never in range. These results are based on the latitude and longitude of my address and refer to NOAA-9 using the period and inclination as quoted in the RIG Newsletter.
Grant's plotted graph for his location can be found on page 29.

Lastly, I hope that you all know about the "Oscar locator" which can be obtained from AMSAT-UK. This is a diagram with a rotating cursor which is used to indicate the track of the satellites.....and there is a cursor labelled "NOAA SERIES WEATHER SATELLITES" in the kit.
Editors note:
Grant has pointed out to me at the last rally that having obtained one of these 'Oscar locators' for weather satellite use he found it very useful if the track of the satellite was used to guide the drawing of two parallel curved lines either side of the ground track. These lines would show the extent of the image produced by the weather satellite image. Obviously this has to be done during a clear pass. The benefit is that when there is heavy cloud obscuring most of the land mass the correctly positioned ground track will show you whats underneath.

MEMBERS LETTERS:

Both Roger Barker and Garry have both hit on the solution for the now famous 'RAM ROT' syndrome that some frame stores exhibit.....

Dear Phil,

I've got the unit working OK, so I thought I would send you a few comments, since I may have discovered something of interested to others. Apart from one missing connection, it all worked first time, including the G6HFS four page mod. The only socket is for the ADC804, since I intend to fit the Dartcom A-D converter.

The only real problem was a tendency for the store to "refill" itself with the start up pattern when the 74LS169's were counting down. It didn't do it all the time, but enough to be annoying. From back issues of the news letter I could see that this was a common problem, so I tried the suggested cure of uping the 5v rail slightly. It didn't work. So I spent hours probing with the scope and found that the RAS, CAS and several other signals changed profoundly in shape when switching from counting up to counting down. The main difference is that when the 169's are counting up, the vertical blanking pulse affects the shape of these signals, when the 169's are counting down it dose not.

After a lot of fiddling around I have found that the problem is that the enable input on pin 9 of the 169's - to which the blanking pulse is connected - has a different effect on the carry output (pin 15) according to which way they are counting. When they are counting up pulling pin 9 low (blanking) pulls the carry low, when counting down, pulling pin 9 low pulls the carry high. This is the cause of the different shape on all the signals.

I have cured the problem by removing the blanking pulse from the two pin 9's and tying them high, this does not seem to have any detrimental effect on the performance of the store.

Either I have a very unusual 74LS169's or this could be a fundamental bug in the Dietemar Gratz mod. I hope this is of interest and possibly help to others.

Roger Barker, G4IDE.

Roger continues:

Dear Phil

A few more notes about my experiences with the YU3UMV frame store-while I'm still full of enthusiasm!

Athough the G6HFS four page mod worked fine, I found that I could not leave the store to "fill up" since it would start to overwrite page 1 when page four was full. The circuit on page 29 prevents this happening.

When page 4 is full, scrolling is disabled. Pressing the manual start / reset button re-enables it.

To add to my previous comments about the data corruption when the 74LS169's are counting down; although tying the pin 9's to 5v works a more "perfect" solution is to tie pins 3, 4, 5 & 6 on each 169 to pin 1. This means that the counters are preset to 255 when counting up, and preset to 0 when counting down. The result is that a carry output is generated on pin 15 each time the counters are loaded. Without this change, the carry is not generated when the counters are not counting down-hence the change of shape of CAS etc.

Finally, I have got the X 4 zoom mod working fine. At first I found that if, in X 4 mod, I had a vertical edge in the picture, some of the pixels would be of set sideways one position. Obviously there was a slight problem with synchronisation at the start of writing each line. I have now cured the problem-perfect vertical edges. I won't bother to include the changes that I have made, because I do not know if the problem was specific to my store. However if other people have the problem, then I can send you the details.

Roger Barker, G4IDE

Dear Phil,

I to have suffered from the dreaded 'RAM ROT', but have now found a cure.

It is to remove the preset-enable signal from the 74LS169 (pin9) This is best done by removing the through-contact that connects pin 4 1215 to pin 9 1213 and 1214, now solder a 1k resistor between pin 9 and pin 16 of 1214.

This mod has worked on two units and has been a complete cure. I am at this present working on a eight memory, mod details to follow when finished and tested.

73's Garry.

Dear O. M.

First let me say that I think you and the team are doing an excellent job with the Newsletter. I find it just about at the right level of interest at the moment. It is only my opinion but, I would beware from getting to technical; there is a similar group that we know who to my mind have made things so that one needs at least a degree in maths or astronomy before you can get very far with their publications. Perhaps that is good but not always Amateur.

If where and when possible I wonder if the orbit Nos. included in the Kep. Details. not essential but could useful.

Current activity at this station is trying to build a converter for my TS820 to enable me to tune between the Amateur Bands to be able to find Bracknell, as the information given in the magazine has aroused my interest there.

One other bit of news from here, is that I invited the ITA (TVS) weather man Mr Lobeck) to come and see the results I was getting. He accepted the offer, was impressed with what he saw and a few weeks later came again complete with camera and sound crew and did a small feature with the weather forecast on TVs.

I wonder if NOAA6 will recover or is it for the scrap heap, well I assume it has gone wrong unless it is sending a different system.

Thank you again for what you are doing for us all and best wishes;

Yours sincerely,
Ivan Cline.

Dear Phil,

Just a small bit of 'info' that may be of use to anyone recording WX PIX.

If you use one of the cassette recorders that have automatic recording level control beware.

It is very critical that you get the correct level of audio input or else you will finish up with black lines across the picture each time a 'one minute marker' appears.

This is of course due to the AGC in the recorder cutting the gain right back when it gets a peak white from the marker, and it takes about two lines of picture be fore it recovers. It is at minimum gain for that period and therefore prints just a black line.

I hope this may be of some interest to any readers who may have had this trouble.

Yours sincerely, Ivan Cline.

ADVERT for MITSUMI SATELLITE TV MODULES

The three modules make an excellent and very cost effective basis for a FM TV receiver suitable for both amateur TV use and Satellite TV.
The modules, each in tinplate case, comprise:

1 Tunable downconverter 950 Mhz - 1750 Mhz to 479.5 Mhz

2 Fixed downconverter 479.5 Mhz to 70 Mhz

3 Video demodulator producing composite video sitting on a 10 volt DC level.

For amateur TV applications a 23 cms preamp is required as the front end is used to receiving a high level drive from the Low noise block normally used in TVRO applications. Approximately 8 volts is needed for 23/24 cms so a receiver working off 12 volts is readily achievable.

For satellite TV provision is made for a DC feed to the LNB and a tunable sound i.f. will be required to resolve the 6 Mhz sound sub carriers. Several circuits have been published in CQ-TV (see CQ-TV 136 page 50).
The modules cover the full band unlike the currently available ASTEC modules and are reported to have a better threshold performance, ref Charlie Suckling's article in CQ-TV 136 page 52.

The units are available from the address below only as a three module package together with circuit details for £64.00 plus £1.00 for pos tage/packing etc. Che ques/postal orders payable to 'J Seaford'.

J Seaford, 14 Nevis Close, Leighton Buzzard, BEDS, LU7 7XD

Also under development is a new high performance FM TV receiver using the MITSUMI front end and the very latest Plessy FM demod chip. It will have the following features:

* Full band coverage for Satellite TV, 950 - 1750 Mhz
* Band spread facilities for amateur TV
* A real 'S' meter circuit that works!
* Polorator drive circuit
* Usual buffered baseband outputs for decoders
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* R.F. output for domestic TV's
* Completely built and aligned PCB

For info sheet and price when it becomes available send sae to above address.

ADVERTISMENT:

Do you have a RIG receiver?
Do you have a BBC micro?

If so store and display weather satellite images of resolution 320x256 pixels by 4 colours using a well established Digitizer board. Tested and aligned and supplied complete with a connected ribbon cable ready to plug into the user port on the BBC. Software supplied on a 40T disc.

Hardware interface and software: £34.00 including Vat and p&p.

INFROTECH SYSTEMS Unit 14, Conway Cresent, Bedford. MK41 7BW.

Other details: * Input same as YU3UMV PCB. * Output, ribbon cable with 20 way IDC plug. * Pin access for "slip control". * Pin access for LED on. * DC supplied from micro (CMOS IC's used). *Usual software features; zoom, printer dump, slip, colour palette, stored image transfer. Supports NOAA, METEOR and METEOSAT. Not a kit. Full documentation supplied.

Frame store help needed in Rosendale !

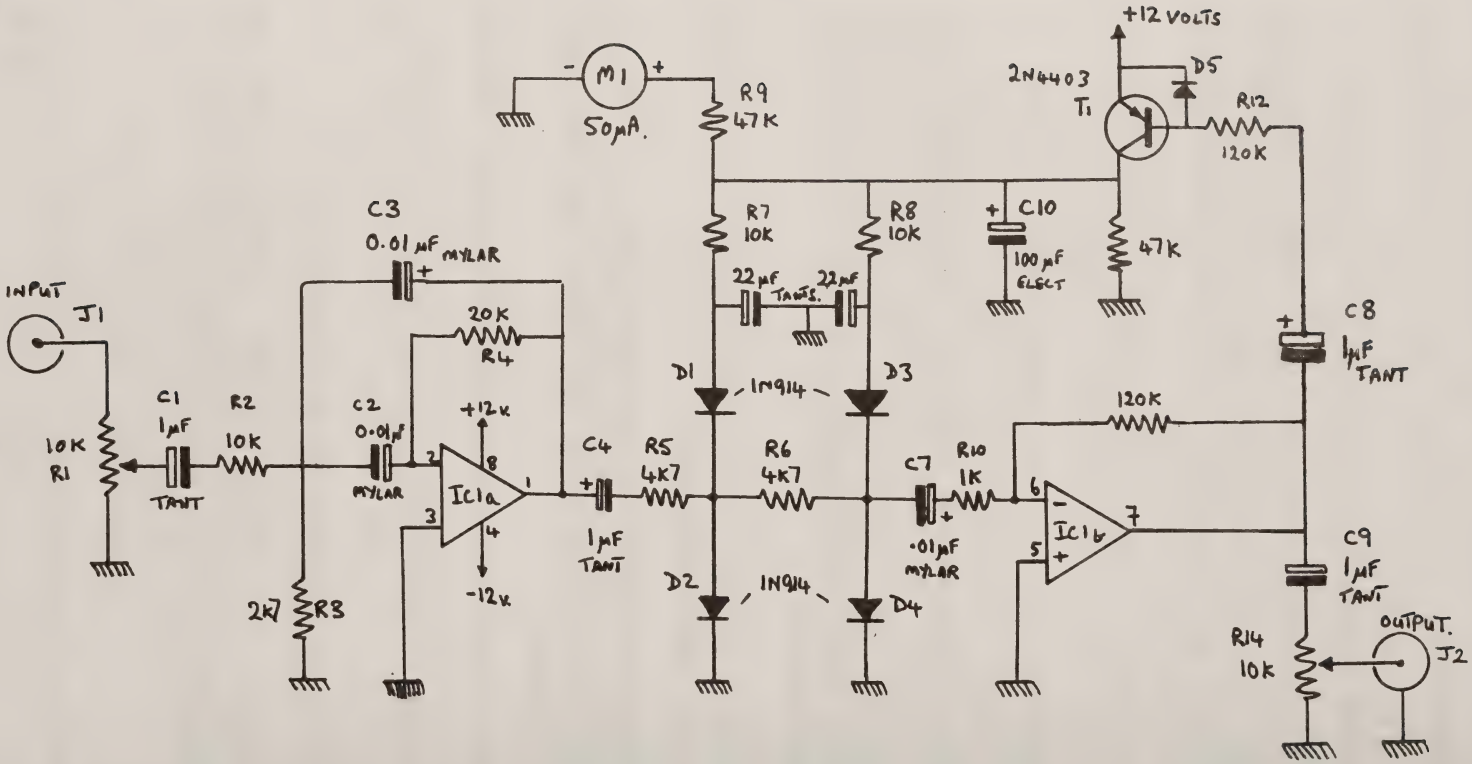
Ted Moore has written requesting local help to debug his framestore. Anybody living in the Manchester, Lancashire or West Yorks who feels able to help sholud contact him on 0706 218290 after 1800 hours, reversing the charges.

Ted's address is Moore Cottage, Edgeside Lane, Waterfoot, Rossendale.

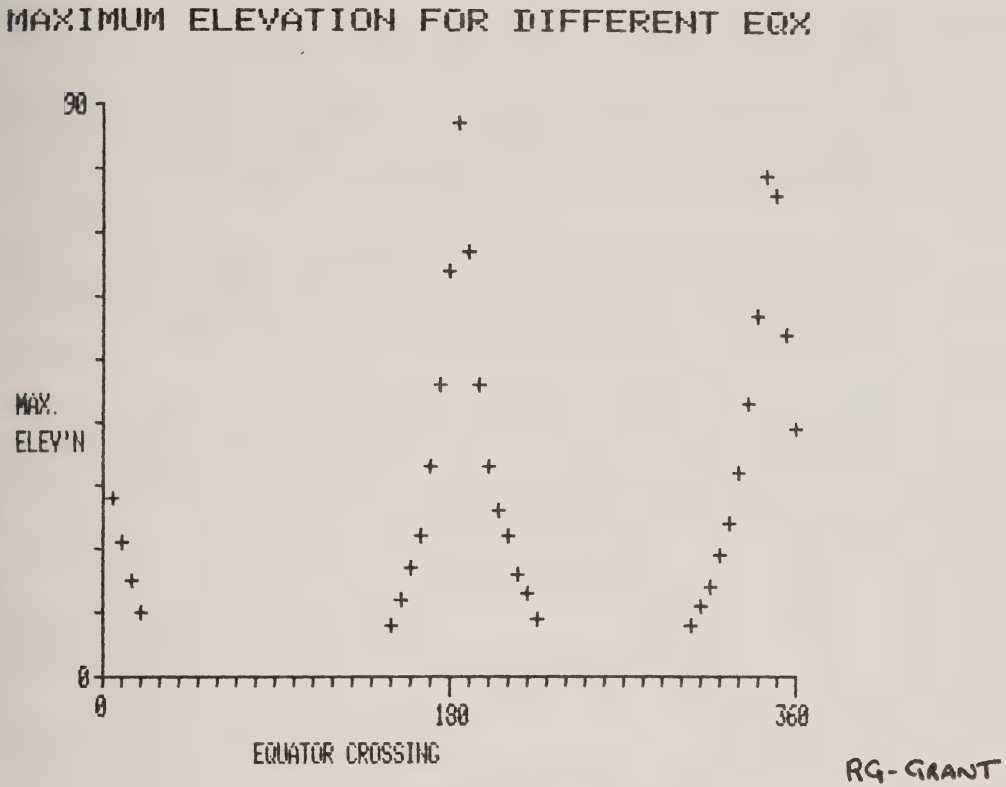
ERRATA

A number of gremlins crept into the last newsletter.

Ralph's Taggarts AGC circuit for the framestore input was reproduced with a vital capacitor missing. The correct circuit is reproduced overleaf with the missing component references added.

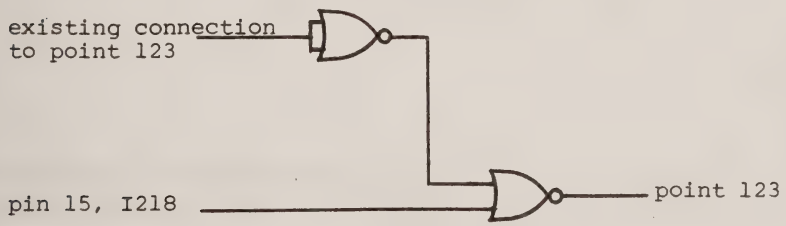


IC1 MC1458 Dual Op Amp.



'AUTO-STOP' FOR THE G6HFS FOUR PAGE CONVERSION

The gates are ¼ of 4001, or 74LS02.



Roger Barker, G4IDE
May 1987

Modified 'TENSAT' software

Cliff Goddard, G4LAA, has sent in the listing of a modified program from the RSGB's Amateur Radio Software Manual called 'TENSAT', it has been modified to run on the BBC micro and incorporates the most of the weather satellites.

Cliff has also sent in a Orbital prediction program for the Texas T157 programmmable calculator which is now available in W H Smith for around £20. The original program came from Amsat-UK, but Cliff does not say exactly from where. So thanks to Amsat-UK.

Here goes, key in the following:

LRN
+
Period (see list)
=
INV
2nd
DMS
Fix
4
2nd
Pause
2nd
Pause
2nd
DMS
RST
LRN
CLR
RST

Assuming an orbital EQX at 07 07 30
Enter 07.0730 (decimal point after the hour!)
Then key
2nd
DMS
RS

The calculator will now cycle through the subsequent orbit times to within a few seconds (2nd Pause given twice in order to give sufficient time to record the readings)

Weather Satellite Periods 24 hours/Mean Motion - These numbers will need to be recalculated using current data.

eg:	MET 3 85-100A	1.8375411
	NOAA 9	1.7013850

Any member requiring a listing of the modified 'TENSAT' should send a A4 stamped addressed envelope plus 3 first class stamps to cover the costs of copying etc to the secretary. No sae or no additional stamps will cause request to be rapidly filed in a ground level receptacle. (I am learning from Ron!).
Furthermore the editor does not have a TI 137 so no queries on the programs please.

Members ad

John de Rivaz has a Mufax G649GA for sale and possibly some related equipment, he may be contacted at: West Towan House, Porthtowan, Truro, Cornwall. TR4 8AX.

More errata from the last issue:

Ken Mills letter, RIG 8, pages 30 and 31:

Errors in the program listing:

line 60 - ther should be quote " between PRINT and NOAA 10

lines 100, 140, 160, 180, 200, 240. - there should be no space between the first quote and ENTER - this will not prevent the program running but it does tidy up the display.

Finally in the program notes - the second line needs lines 10 and 20 which of course should read lines 20 and 30.

RIG Shop Corner

Meteosat Downconverter - Fully described in RIG 8:-

a). Assembled and tested module in tin plate box:-
£129.69 + £1.00 p&p.

b). Complete mounted in weather proof box:-
£149.56 + £2.00 p&p.
Waterproof power and channel change connector £10.00 extra if required.

The RIG Receiver module is proving to be very popular with members and is still available from the secretary. The full specification was printed in RIG 5, but briefly the spec. is:

136 - 138 MHz Scanning receiver module
Sensitivity 0.2uV for 12 db SINAD at 10 kHz deviation
IF bandwidth 50 kHz
Audio tailoring specically designed for weather sats.

Built and aligned PCB together with channel display module, Molex PCB connectors and optionally, a full frequency LCD readout.

Basic module with channel display £91.75

as above with LCD frequency display £131.65

Price includes packing and recorded delivery.

The RIG VHF preamp also available includes a bandpass filter and is ideal for masthead mounting. The spec. was printed in RIG 7. It is available from the secretary as a built and aligned PCB measuring 85mm by 33mm (3 5/16 x 1 15/16 inches).

Module including first class post £12.50

For all the above cheques payable to "Remote Imaging Group" please

Anybody requiring PCBs should contact the secretary, G8XTW.

Other items:

A-D module for superb grey levels on the framestore	£17.73
1 Metre Spun aluminium dish ideal for Meteosat	£34.00
Tubular feed horn with tripod mount for dish above	£32.50
** New ** Mount for dish to a vertical pole	£22.00

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weather satellite kits

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- North/South picture inversion facility
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- WEFAX compatible with suitable demodulator
- Demo Disc available (£3, refundable)

£ 49.95 incl. VAT

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MSR20 MkII Receiver
MSR20H Receiver Hardware Kit
NEW MSA20 Aerial Kit

Special Package Price £ 126.95 incl. VAT

NEW RECEIVER HARDWARE KIT - A complete kit of hardware to finish the MSR20 receiver, including; metal case, mains transformer, fuse, fuse holder, pillars, LEDs, glands, knobs, on-off switch, etc. £ 11.95 incl. VAT

NEW MSR20 MKII RECEIVER KIT - A super-sensitive, low noise receiver. Features of the new design include built-in audio mute, electronic channel switching, and facilities for adding auto-scan, and signal strength metering modules. The receiver also has a built-in relay for automatic switching of a cassette recorder, and the PCB layout can also accommodate components for a 12v regulated PSU.

£ 54.68 incl. VAT

NEW UNIVERSAL SIGNAL STRENGTH METER - A completely new design, offering greatly improved sensitivity for comparing weak signals, with a log scale to accomodate large signals. Operates directly from any I.F between 455KHz and 18MHz. Kit comes with comprehensive instructions.

£ 8.95 incl. VAT

YU3UMV FRAME STORE KIT - All components for the decoder and frame store (excluding pcbs, which are obtained from Phil Seaford) offered to RIG members at the special inclusive price of £ 68.71 incl. VAT
As above, but with 256k memory ICs £ 78.37 incl. VAT

LOK SYNC. BOARD KIT - A complete set of parts to populate the LOK PCB which is available from Phil Seaford. £ 25.85 incl. VAT

MSK20 137MHz PREAMP - The ultimate in low noise preamps for low noise pictures! Will work with any receiver - for best results place at the aerial mast. Complete kit includes connectors and diecast metal box.

£ 10.95 incl. VAT

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Access

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